

AMENDMENTS

In the Claims:

This listing of claims replaces all prior versions, and listings, of claims in this application.

1. (Currently Amended) A heating-type balloon catheter device having a heating-type balloon at a top end portion of a catheter main body and a vibration imparting device connected to a base end portion of the catheter main body and configured to impart vibration to a liquid for heating in the heating-type balloon through a liquid for heating filled in the catheter main body, said vibration imparting device comprising:

an elastic tube with a base end portion thereof connected to said catheter main body and with a top end portion thereof closed, said elastic tube being filled with a liquid for heating; and

a vibrator device having a roller configured to rotate about a rotary shaft at a position offset to the rotary shaft,

wherein said elastic tube is set in direct contact with said roller so that a predetermined direction of rotation of said roller extends from the side of the base end portion of said elastic tube in a longitudinal direction of the elastic tube to the side of the top end portion thereof in the longitudinal direction and a margin volume part which is not pressed with said roller is provided on the side of the top end portion of said elastic tube; and

wherein said elastic tube is configured to assume a shut-off state and a communication state in accordance with rotation of said roller in its predetermined direction, the shut-off state being a state in which the base end portion side of said elastic tube and the top end portion side thereof are blocked by pressing said elastic tube with the roller and reducing a radial size of said elastic tube with the roller and the communication state being a state in which the base end portion side of said elastic tube is communicated with the top end portion side thereof by enlarging and recovering the size of said elastic tube due to elasticity by releasing the pressing of said elastic tube with the roller; and

wherein the heating liquid in said elastic tube is supplied with pressure toward said margin volume part when said elastic tube is in the shut-off state while the heating liquid pressurized in said margin volume part flows backward toward the base end portion side of said elastic tube when said elastic tube is in the communication state, in accordance with rotation of the roller in the predetermined direction of rotation of the roller.

2. (Original) The heating-type balloon catheter device as claimed in claim 1, wherein said elastic tube is connected to the base end portion of said catheter main body through an extension tube which is superior in rigidity and unlikely to be deformed by expansion and constriction in a radial direction thereof.

3. (Previously Presented) The heating-type balloon catheter device as claimed in claim 1, wherein:

a connector having plural branch passages is fitted to the base end portion of said catheter main body; and

said elastic tube is connected to a predetermined branch passage of the connector for supplying a contrast agent.

4. (Original) The heating-type balloon catheter device as claimed in claim 3, wherein:
said elastic tube is connected to the predetermined branch passage through a shift valve; and
said shift valve is set to assume a first shift position for supplying the catheter main body with a contrast agent by blocking a communication between said elastic tube and said catheter main body and a second shift position for communicating said elastic tube with said catheter main body.

5. (Currently Amended) ~~[[The]]~~ A heating-type balloon catheter device as claimed in claim 1, having a heating-type balloon at a top end portion of a catheter main body and a vibration imparting device connected to a base end portion of the catheter main body and configured to impart vibration to a liquid for heating in the heating-type balloon through a liquid for heating filled in the catheter main body, said vibration imparting device comprising:

an elastic tube with a base end portion thereof connected to said catheter main body and with a top end portion thereof closed, said elastic tube being filled with a liquid for heating; and a vibrator device having a roller configured to rotate about a rotary shaft at a position offset to the rotary shaft,

wherein said elastic tube is set in contact with said roller so that a predetermined direction of rotation of said roller extends from the side of the base end portion of said elastic tube to the side of the top end portion thereof and a margin volume part which is not pressed with said roller is provided on the side of the top end portion of said elastic tube,

wherein said elastic tube is configured to assume a shut-off state and a communication state in accordance with rotation of said roller in its predetermined direction, the shut-off state being a state in which the base end portion side of said elastic tube and the top end portion side thereof are blocked by pressing said elastic tube with the roller and reducing a radial size of said elastic tube with the roller and the communication state being a state in which the base end portion side of said elastic tube is communicated with the top end portion side thereof by enlarging and recovering the size of said elastic tube due to elasticity by releasing the pressing of said elastic tube with the roller,

wherein the heating liquid in said elastic tube is supplied with pressure toward said margin volume part when said elastic tube is in the shut-off state while the heating liquid pressurized in said margin volume part flows backward toward the base end portion side of said elastic tube when said elastic tube is in the communication state, in accordance with rotation of the roller in the predetermined direction of rotation of the roller, and

wherein an indicator is provided on an outer peripheral surface of said elastic tube, which indicates a size of said margin volume part to be set in accordance with a size of said balloon.

6. (Original) The heating-type balloon catheter device as claimed in claim 5, wherein said indicator is set on the basis of a predetermined position of a housing of said vibrator device.

7. (Previously Presented) The heating-type balloon catheter device as claimed in claim 6,

wherein:

the predetermined position of the housing is set to a position which is located on an orifice edge surface on an outlet side of the housing or in the vicinity thereof and which is readily visible from outside, and

said indicator is formed in plural numbers at spaced intervals in an area extending from the top end portion side of said elastic tube to the base end portion side thereof.

8. (Original) The heating-type balloon catheter device as claimed in claim 1, wherein at least one air vent valve for withdrawing air in a predetermined path is disposed on the predetermined path extending from the base end portion of said catheter main body to the top end portion of said elastic tube.

9. (Original) The heating-type balloon catheter device as claimed in claim 8, wherein said air vent valve is connected to the top end of said elastic tube.

10. (Original) The heating-type balloon catheter device as claimed in claim 8, wherein said air vent valve comprises a first air vent valve connected to a path extending from said catheter main body to said elastic tube and a second air vent valve connected to the top end of said elastic tube.

11-18. (Cancelled)